

In the Claims:

Please amend the claims as follows:

1. (Currently amended) A process for the carbonylation of conjugated dienes, whereby a conjugated diene is reacted with carbon monoxide and a hydroxyl group containing compound selected from the group consisting of alkanols and alkane diols in the presence of a catalyst system including:

- (a) ~~a source of palladium cations~~ salt,
- (b) a phosphorus-containing ligand,
- (c) ~~a source of anions~~ protonic acid having a pKa value of greater than 1,

wherein the phosphorus-containing ligand is a ligand having the general formula I



wherein X^1 and X^2 represent a substituted or non-substituted cyclic group with at least 5 ring atoms, of which one is a phosphorus atom and the rest are carbon atoms, wherein the substitution, if any, is provided by one or more hydrocarbyl groups containing carbon atoms and/or hetero atoms, and R represents a bivalent organic bridging group, connecting both phosphorus atoms, containing ~~from 1 to 4~~ 2 or 3 carbon atoms in the bridge; and wherein the molar ratio of conjugated diene to palladium cation is at least 300:1.

2. (Original) A process as claimed in claim 1, wherein the conjugated diene is 1,3-butadiene.

3. (Currently amended) A process as claimed claim 1, wherein the hydroxyl group containing compound is an alkanol with ~~a to 6~~ from 1 to 20 carbon atoms per molecule.

4. (Previously presented) A process as claimed in claim 1, wherein component (b) of the catalyst system is a phosphorus-containing ligand of formula (I), wherein the bivalent organic bridging group R is an ethylene or a propylene group connected via their terminal carbon atoms to the respective phosphorus atoms of X^1 and X^2 .

5. (Currently amended) A process as claimed in claim 1, wherein X^1 and X^2 represent a substituted or non-substituted bicyclic group with at least 5 ring atoms, of which one is a phosphorus atom and the rest are carbon atoms.

6. (Currently amended) A process as claimed in claim 5, wherein X^1 and X^2 represent a substituted or non-substituted [3,3,1] or [4,2,1] 9-phosphabicyclononyl group wherein the substitution, if any, is provided by hydrocarbyl groups containing carbon atoms and/or hetero atoms.

7. (Currently amended) A process as claimed in claim 6, wherein one or both of the phosphabicyclononyl ~~ring~~ groups is substituted with one or more alkyl groups having from 1 to 4 carbon atoms.

8. (Currently amended) A process as claimed in claim 1, wherein ~~component (C) of catalyst system contains a~~ the protonic acid with a pKa value > 1 in aqueous solution at 25°C or a salt thereof is selected from the group consisting of sulphuric acid, phosphoric acid, and carboxylic acids.

9. (Currently amended) A process as claimed in claim 1, ~~where~~ wherein 1,3-butadiene is converted into methyl pentenoate ~~and/or dimethyl adipate.~~

10. (Currently amended) A process to prepare ~~caprolactam~~ ε-caprolactam, Nylon 6, or Nylon 6,6 wherein ~~a compound as~~ methyl-pentenoate prepared according to the process of claim 1, ~~is used as an intermediate~~ hydroformylated to methyl formylvalerate which is subjected to reductive amination and cyclisation to form ε-caprolactam.

11. (Withdrawn) Use of a catalyst system based on:

- (a) a source of palladium cations,
- (b) a phosphorus-containing ligand,
- (c) a source of anions,

wherein the phosphorus-containing ligand is a ligand having the general formula I:



wherein X^1 and X^2 represent a cyclic group with at least 5 ring atoms, of which one is a phosphorus atom, and R represents a bivalent organic bridging group, connecting both phosphorus atoms, containing from 1 to 4 atoms in the bridge; and wherein one or both cyclic groups X^1 and X^2 are substituted with one or more alkyl groups having from 1 to 4 carbon atoms, as a carbonylation catalyst for the carbonylation of conjugated dienes.

12. (Withdrawn) Use according to claim 11, wherein the phosphorus-containing ligand is 1,2-P,P'bis(1,5-dimethyl, 9-phosphabicyclononyl)ethane.

13. (Withdrawn) Use of the catalyst system as claimed in claim 11, as a carbonylation catalyst.

Please add the following new claims:

14. (New) The process of claim 1 wherein the conjugated diene is selected from the group consisting of conjugated dienes having from 4 to 20 carbon atoms per molecule.

15. (New) The process of claim 14 wherein the conjugated diene is selected from the group consisting of conjugated dienes having from 4 to 8 carbon atoms per molecule.

16. (New) The process of claim 1 wherein the alkanol has from 1 to 20 carbon atoms per molecule and the alkane diol has from 2 to 20 carbon atoms per molecule.

17. (New) The process of claim 16 wherein the alkanol contains from 1 to 6 carbon atoms per molecule and the alkane diol contains from 2 to 6 carbon atoms per molecule.

18. (New) The process of claim 1 wherein the palladium salt is a carboxylic acid palladium salt.

19. (New) The process of claim 18 wherein the carboxylic acid palladium salt contains up to 10 carbon atoms.

20. (New) The process of claim 8 wherein the protonic acid is a carboxylic acid.

21. (New) The process of claim 20 wherein the carboxylic acid is a benzoic acid.

22. (New) The process of claim 21 wherein the benzoic acid is substituted with a substituent selected from the group consisting of halide groups, hydrocarbyl groups, carboxy groups, and alkoxy groups.

23. (New) The process of claim 22 wherein the substituents are selected from the group consisting of methyl and methoxy groups.